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RCT Continuing Training: 3rd Quarter 2021 Presentation Transcript

Slide #1.1 – 2021 3rd Quarter Continuing Training

Slide #1.2 – Introduction

“Welcome to RCT Continuing Training, Third Quarter twenty, twenty-one. This quarter’s training consists of two parts, viewing this online lecture and completing the associated exercise guide. The online lecture will review performing job coverage and all of the necessary steps associated with it. The second portion of this training is an exercise guide, which can be found in one of two places: in the initial email sent out for continuing training, or on U-Train by accessing U-Train course number 52255. It is recommended that you have the exercise guide with you to work on while viewing this online presentation.

Slide #1.3 – Terminal Objective

“The terminal objective that will be covered for this quarter’s continuing training is the following: Given the need to perform radiological job coverage recognize the requirements to maintain radiological work control in accordance with P121, *Radiation Protection* and RP-PROG-TP-200, *Radiation Protection Manual*.”

Slide #1.4 – Enabling Objectives

“The enabling objectives that will be discussed over the course of this training include: identify the components of an RWP brief, explain how to implement work controls as required per the RWP, identify different methods used to monitor radiological work conditions, identify the necessary documentation for job coverage, explain the stop work/pause work processes”

Slide #1.5 – Enabling Objectives Continued

“Identify the reporting criteria to submit an RPIN, and explain the method of performing a whole-body frisk

These objectives are set up to demonstrate the processes an RCT should take to conduct job coverage from start to finish.”

Slide #1.6 - Role of an RCT

“Los Alamos National Laboratory maintains broad science, technology, and engineering capabilities across multiple disciplines, leveraged to meet the Lab’s diverse national security missions. Radiological Control Technicians serve an important part in this mission by monitoring the diverse radiological conditions at the Lab. This role is critical in maintaining personnel safety from radiological hazards, and to keep occupational radiation exposure As Low As Reasonably Achievable.”

Slide #1.7- Job Coverage Industry Event

“We will review a lesson’s learned that reinforces the importance of RCTs and their ability to maintain control of radiological work in the field. In 2011 an event occurred within PF-4 where packages were being removed from a vault. Following the removal from the vault, the packages were transported to a different room. Insufficient surveys and a lack of questioning attitude led to the discovery of an un-posted High Radiation Area. Follow-up interviews with the workers concluded the individuals experienced a perceived time pressure to get the job completed. If you would like to read the full description on this lesson learned, click on the report seen on the screen.”

Slide #1.8 - Series of Events 1 of 3

“Let’s discuss what took place. An RCT was assigned to cover the job removing packages from a vault in PF-4. The old HPRMS tags on the items, which were believed to be from the early 1990’s, were no longer legible and could not be read. Initial package dose rates could not be taken in the vault due to high background levels. Radiation dose on the packages were assumed not to be an issue due to the Pu-238 concentrations listed on the paperwork. It was not identified the package also consisted of light elements which generated an unanticipated high dose rate due to α -n reactions”

Slide #1.9 - Series of Events 2 of 3

“Following the movement out of the vault, the workers and RCT separated. No RCT coverage was requested when the packages were opened due to previous survey history of similar items. A nearby Model 215 began to alarm. The workers notified an RCT and follow-up surveys with an RO-20 discovered 25 mr/hr at 30cm. The RCT did not have an NRD available to check the packages. Contamination surveys found no detectable activity.”

Slide #1.10 - Series of Events 3 of 3

“The RCT left the area and the items were relocated to another room. Following the transfer, the workers requested another RCT to survey the packages for neutrons. The neutron survey discovered 375 mrem/hr at 30 cm, creating the discovery of an unposted high radiation area. EPDs were not required to be used per the RWP. It was estimated that approximately 25 mrem was received due to the event. The room and nearby corridor were red-lit.”

Slide #1.11 - Industry Event – What Caused This?

“Relocating packages sounds like a straightforward evolution that RCTs commonly encounter. However, this case is a great example of how a routine job can be overlooked and turn into an industry event. Let’s take a look at what variables caused this incident to develop, and things that could have helped to prevent it. Contributing factors to the event were: lack of a questioning attitude, making too many assumptions, not performing the correct surveys in a timely manner, insufficient job coverage, not using the correct survey instrumentation, inadequate RWP requirements, and electronic dosimetry not being used effectively.

Actions or tools that should have been used for this job include: A job specific RWP, conducting a formal RWP brief with all parties involved with the work, implementing the RWP work controls, maintaining continuous job coverage, conducting pre-job, during work, and post-job surveys, and reinforcing ALARA practices.

We will now discuss these actions in more detail and how an RCT can utilize these to effectively perform job coverage.”

Slide #1.12 – Radiological Work Controls

“Radiological evolutions conducted at LANL are reinforced with a hierarchy of controls which include the following: Elimination or substitution. Such as with decontaminating an item or letting it decay. Engineering controls. HEPA filtration or lead shielding are examples of engineering controls. Administrative controls. RWPs and FRPRs fall under this. And lastly, PPE. This should be the final line of defense, such as with respirator use or PCs. The role of the RCT is to ensure these controls are enforced and to provide radiological oversight to the workers.”

Slide #1.13 – Radiological Work Permits

“A Radiological Work Permit is a document used to identify radiological conditions, establish worker protection, monitoring requirements, and contains specific approvals for radiological work activities. The RWP serves as an administrative process for planning and controlling radiological work and informing the worker of the conditions in the area. These can be developed for routine day-to-day evolutions or more complex job specific tasks.”

Slide #1.14 – RWP Usage

“Per RP-PROG-TP-200, RWPs are required to be used for:

High hazard radiological work as defined in P121 Table 11-4, *Radiological Work Permit and Integrated Work Document decision requirements for radiological work*, Moderate hazard radiological work if the work is NOT covered by a Facility Radiation Protection Requirements (FRPR), and direct handling of radioactive material with an uncorrected contact instrument reading >50 mR/h (except DU), if the work hazards and controls are NOT specifically defined in an FRPR.”

Slide #1.15 – RWP Review

“Review of the RWP and previous survey data should be completed prior to starting the pre-job brief. This is to verify the radiological requirements are sufficient for the work being performed and no mistakes have been made. It also allows for time to plan for the job, which can help

prevent work delays due to lack of preparation. As an RCT, you never want the first time reading an RWP to be during the pre-job brief.

Key areas of an RWP to review are: EPD settings, RWP expiration dates, suspension limits, PPE requirements, and the necessary training to work on the RWP.”

Slide #1.16 – RWP Requirements Matrix

“RWP limits are created around a set of matrices found in the procedure RP-PROG-TP-104, *Radiological Work Permit Process Using Sentinel*. These tables have pre-established requirements based on the radiological conditions of the job.

During their review, the RCT can reference these tables to their RWP. This questioning attitude can help discover potential issues before they are found after commencing the job.

The table seen here shows requirements based upon expected job location dose rates. These include dosimetry, job coverage type, and PPE.”

Slide #1.17 – RWP Copy Control

“In order to ensure multiple copies of an RWP are not being circulated and the correct revision is being used, a copy control procedure is in place. This is also in RP-PROG-TP-104. Control official RWP copies by performing the following:

Enter the FOD, RWP Authority Name and Z# at the top of RP-PROG- FORM-097, Radiological Work Permit (RWP) Check-Out Log to initiate a new log sheet for official copies.

Stamp any printed official copies with “Official Copy #” where “#” is a unique number for each copy.”

Slide #1.18 – RWP Copy Control Continued

“Complete an RP-PROG-FORM-097, *RWP Check-Out Log* entry for each official copy by entering the RCT Name, RWP Work Location, RWP #, Official Copy #, RWP Expiration Date, and Check-Out Date.

IF an official copy is returned to the RWP Authority, then enter the Date Returned into the applicable RP-PROG-FORM-097 row.

IF an RWP is revised, then ensure all official copies of the old revision are collected and log the Date Returned for each copy on RP-PROG-FORM-097.

IF an RWP expires, then ensure all official copies of the expired RWP are collected and log the Date Returned for each copy on RP-PROG-FORM-097.

Shred any old RWP revisions or expired RWP copies.”

Slide #1.19 – RWP Briefings

“When an RWP brief is being conducted, workers and supervisors directly participating in the job, cognizant radiological control personnel, and representatives from involved support organizations should attend the pre-job briefing.

A briefing is required if an RWP exists without an IWD or the IWD brief does not adequately cover radiological hazards and controls.

The RWP will also state the required frequency for performing the briefs.”

Slide #1.20 – Pre-job Briefing Information

“During the brief, there are a number of key topics that the RCT should discuss. This briefing should be interactive to keep everyone engaged and reassure that they understand the scope of the work. At a minimum, pre-job briefings should include the following information:

Scope of work to be performed, radiological conditions of the workplace, procedural and RWP requirements, special radiological control requirements, radiological control hold points”

Slide #1.21 – Pre-job Briefing Information Continued

“Radiological suspension limits, communications and coordination with other groups, verification of required training and bioassay enrollments, provisions to responding to unanticipated or emergency conditions, and lastly, allow an opportunity for questions and discussion among the attendees. This is one of the most important portions of the brief which can help clear up any confusion or misinterpretations prior to the work begins.”

Slide #1.22 – Obtaining Information

“Reviewing only the RWP is not enough preparation to perform job coverage. More information should be gathered by the RCT prior to commencing the work.

It is beneficial to find out the following information before the RWP briefing: expected number of workers, their experience levels, expected time to perform the job, material taken into and removed from the worksite, and any previous RPINs associated with this job type.

By obtaining this information, the RCT can better prepare for the job and verify the RWP conditions will be sufficient.”

Slide #1.23 – Review of Work Site Survey Data

“Following the RWP portion of the pre-job brief, review the survey map, if one is available, with the workers. Areas to review include: Work area dose rates, low dose waiting areas, boundaries and postings, egress routes, and locations of personal monitoring locations.

Discussing the work location can help raise concerns ahead of time that would not otherwise be addressed in the RWP portion of the briefing. These could be things such as worker position at the job site or the boundaries not being large enough to support the work.”

Slide #1.24 – RWP Pre-job Briefing Log

“At the end of the brief, the RCT will answer any questions and confirm all requirements have been met. The pre-job briefing log associated with the RWP will need to be signed by all personnel attending the brief, including the RCTs. This log acts as a legal record stating the

signee has been briefed, understands, and will adhere to all hazards/controls/training defined by the RWP. It is also important to verify the current revision and expiration date of the RWP is used for the brief.”

Slide #1.25 - Stay Time Calculation

“As an RCT, it is important to be aware of time restraints a worker has while performing a job due to dose limits. Performing stay-time calculations based on allowable dose and work area dose rates can help determine these time requirements. The base equation to determine stay time is allowable dose divided by the work area dose rates. We will now walk through an example problem on how to determine a stay time.

In this scenario, the annual allowable dose is one-thousand mrem per year. The worker has already received 450 mrem to date. How long can they stay in a dose rate field of 90 mrem per hour before reaching their dose limit?

To do this problem we will first need to get the total remaining allowable dose. This is achieved by subtracting the 450 mrem from the 1000 mrem, which results in 550 mrem. Now we simply divide the 550 mrem by the dose rate of 90 mrem per hour. This gives us a stay-time of 6.1 hours until the limit is reached.”

Slide #1.26 – RWP Field Changes

“There may be occasions where a change in the RWP needs to be made while in the field. RP-PROG-TP-104 gives guidance on how to conduct these changes and when they are allowed to be made. Field changes should only be made for circumstances where RWP Authorities and approvers are not readily available to change and approve the RWP electronically, such as during shift work or weekend work. All field changes shall be approved by an RP Manager who is also a trained and authorized RWP Approver. IF the work is authorized by an IWD, THEN the PIC must approve all field changes to the RWP, in addition to the RP Manager. All approving individuals, including the supporting RCT, must agree that the proposed field changes are appropriate and no new hazard is introduced.”

Slide #1.27 – Field Change Exclusions

“RWP field changes are not permitted for the following situations:

Change in work scope outside the work authorization document, new hazard not initially identified during the hazard analysis, increase in EPD dose rate or dose alarm limits, increase in individual or collective dose limits, increase in respiratory protection requirements”

Slide #1.28 – Field Change Exclusions Continued

“Increase in PPE requirements, excluding booties and gloves, adding use of temporary enclosures, use of HEPA filtered air movers excluding HEPA vacuum cleaners, increase in suspension limits greater than three times the value on the RWP, and any work in radiation fields ≥ 1 Rem/hr”

Slide #1.29 – Documentation of Field Changes

“When the RWP field change is made, there is procedural guidance on how it needs to be annotated. Document the field change on the RWP by performing the following:

Pen and ink the changes in appropriate sections of the RWP. The supporting RCTs will initial and date the field change on the RWP. Obtain approval from RP Manager and PIC.

IF on-site and available, THEN the RP Manager and PIC initial and date the field change on the RWP. IF the RP Manager or PIC are not available, THEN the supporting RCT will obtain verbal approval and write, per verbal conversation with name and title on the RWP for each missing individual. Field changes must be electronically incorporated into the RWP and the RWP approved within one working day of the field change.”

Slide #1.30 – Knowledge Check #1

Slide #1.31 – Knowledge Check #2

Slide #1.32 – Implementing RWP Work Controls

“Now we will discuss the importance of implementing the RWP work controls. The RCT provides radiological technical support and assists the workers in understanding and complying

with the RWP. Failure to implement these requirements can lead to the possibility of personnel contamination, unnecessary dose exposure, or the release of radioactive material to the public. These events can be prevented by providing effective job coverage throughout the course of the work.”

Slide #1.33 – Types of Job Coverage

“RCT job coverage requirements are based on a hazard assessment, found in *P121 Radiation Protection, Chapter 11*. The two types of job coverage are: Intermittent and Continuous. For intermittent coverage, the RCT is required to be present at predetermined portions of the job that have a potential of changing the radiological conditions in the area.

Continuous coverage: the RCT is required to be present at all times for the duration of the job. They will need to be in the vicinity of the job and able to communicate with the workers. This is to ensure they have the capability to stop work if needed.”

Slide #1.34 – RCT Required Coverage

“There are specific activities that procedurally require RCT involvement. P121, Section 1122 lists these activities as the following: Receiving radioactive material shipments, Initial opening of shipped containers of radioactive materials; Breaching contaminated systems, Whenever respiratory protection is required to control radiological exposure, Responding to radiation protection instrumentation alarms;”

Slide #1.35 – RCT Required Coverage Continued

“Surveying materials and equipment to be released from RCAs for contamination, CAs, HCAs, or ARAs; Entering and exiting CAs, HCAs, ARAs, HRAs and VHRAs, Placing, removing, or modifying radiological posting, and when an unusual or abnormal condition is discovered involving areas, materials, systems, containers, or devices posted or labeled for radiological hazards. As an RCT, whenever these events are being conducted, you should realize that constant coverage needs to be performed.”

Slide #1.36 – Failure to Implement Work Controls

“Even with administrative hazard controls in place, such as an RWP, industry events continue to occur. A contributing factor to these incidents is human performance errors. Precursors associated with these include: Poor work habit patterns, worker complacency, lack of critical thinking, inadequate RWP briefing, and insufficient peer-checking. We will now take a closer look into these precursors and how they relate to the duties of an RCT.”

Slide #1.37 – Poor Work Habit Patterns

“When poor work habits are observed, the RCT should correct the issue immediately and explain to the worker the reason behind it. The explanation will help the worker get an understanding on why they are being corrected and more likely lead to them not repeating this action in the future. Here are some examples of poor work habits: Not utilizing low dose waiting areas, touching of the face while in PCs, reaching over radiological boundaries, improper doffing, and ineffective whole-body frisking.”

Slide #1.38 – Worker Complacency

“Complacency is a common contributor to radiological incidents. It causes personnel to become too comfortable in their environment, which can lead to mistakes. Examples of worker complacency include: Failing to recognize posting changes in areas frequently worked, rushed RMI surveys where new radiological conditions may be overlooked, Disregard for PPE can happen when people get too comfortable being around radioactive material, not reading HPRMS tags prior to opening a container deemed to be low risk of contamination, and performing insufficient free-release surveys on objects assumed not to be radioactive material.”

Slide #1.39 – Lack of Critical Thinking

“Radiological job coverage does not always go as planned. It is important for the RCT to be prepared for adverse situations. Different ways an RCT can do this include: Asking the HPFC or other RCTs for advice and personal lessons learned when they have performed similar jobs. This type of information can be some of the most helpful to a junior RCT. Bringing extra

supplies such as smears, bags, and absorbents. It is always better to be over prepared then having to pause the job to get more materials. Discuss with the workers beforehand about possible outcomes that can occur, and how to handle them. You don't want to be caught off guard when conditions change. And if available, have another RCT assist with the job.”

Slide #1.40 – Inadequate RWP Briefing

“The RWP brief is a critical part in job coverage. This is where the RCT can verify the workers understand the radiological requirements. During the brief an RCT should: Be interactive with the attendees by asking questions and discussing past experiences on this work. Point out any conditions that have changed since the last brief was conducted. There may be new hazards in the area not previously addressed such as potential heat stress or changes in egress routes. Discuss past lessons learned. Verify all training and bioassay enrollments are up to date, and finally, confirm that the current revision is being used and signed.”

Slide #1.41 – Insufficient Peer Checking

“Peer checking is an effective tool that can help mitigate mistakes prior to them becoming a larger issue. Different ways peer checking can be applied in radiological protection includes: Ensure PPE is donned correctly prior to going into the work area, peer checking surveys, verify postings and boundaries are sufficient, remind workers to check their dosimetry during the job, and monitoring worker's contamination control methods while handling radioactive material.”

Slide #1.42 – Knowledge Check #3

Slide #1.43 – Preparing for the Job

“Prior to the brief, the RCT should plan and prepare for everything they will need to perform the job coverage. Walk down the area, if possible, to assess the conditions and better determine any supplies needed. Things to consider include: Gathering your survey materials needed, setting

up the work site, ensuring instrumentation is checked for the day, have dosimetry available, verify postings in the area and work area configurations, get your air sampling equipment staged, confirm a power supply is available if one will be needed, get engineering controls staged, verify size of the work area is sufficient to support personnel and equipment and making sure a PCM or HFM is operable.”

Slide #1.44 – Starting the Job

“When arriving at the jobsite, it is good practice to perform a condensed brief. This helps refresh what was discussed during the RWP brief, especially if it has been awhile since it was performed. Reconfirm the work location such as the correct valve or glovebox. Point out areas of higher dose and low dose waiting areas. Review egress routes and emergency actions. Going through this at the location helps create a clearer picture on job expectations. Now it is time to start the work.”

Slide #1.45 – Implementation of Controls

The RWP contains sections that will provide guidance on what, how, and when to implement radiological controls. These include: radiological requirements, hold points, instructions, work area configuration, and other instructions. Let us take a closer look into what type of information can be found in these.”

Slide #1.46 – Radiological Requirements

“Radiological Requirements. This section of the RWP acts as a baseline for what needs to be met prior to starting any job coverage. Requirements listed in this portion of the RWP include: bioassay enrollments, coverage type of either intermittent or continuous, dosimetry, briefing frequency, protective clothing requirements, and training.”

Slide #1.47 – Hold Points

“Hold Points. These are defined as pause points in a work activity where radiological conditions may change and a special or specific action, such as a survey, is required of workers or RCTs. Examples of different hold points are: External survey required upon withdrawal of a source from shielding, survey required upon removal of a glove box window or glove from the box structure, and hold point for RCT to take a sample for HPAL analysis.”

Slide #1.48 – Instructions

“Instructions. This field includes any specific instructions for workers or RCTs related to the work activity. Instructions may apply to the entire RWP, or to particular tasks. Types of instructions can be: A remote handling tool must be used, Nasal smears are required if unanticipated contamination is found, and put work in safe condition and immediately exit the area if a CAM alarms.”

Slide #1.49 – Work Area Configuration

“Work area configuration. This field includes required work area controls established to ensure exposures are maintained As Low As Reasonably Achievable. Examples include: Securing of ventilation, postings such as an HJEA, red-lighting a room, barrier placements, and contamination control measures.”

Slide #1.50 – Other Instructions

“Other instructions. This is a miscellaneous field for information that does not fall into the categories previously described. Examples for other instructions can be: References to work authorizing documents, or statements such as small, localized contamination above the RWP suspension limit is permitted only if the RCT determines that the contamination can be immediately decontaminated or controlled.”

Slide #1.51 – Monitoring Radiological Work Conditions

“Now that controls have been implemented, we will discuss ways to monitor work conditions. Once the job begins, the RCT’s responsibility is to monitor the radiological conditions and maintain exposure ALARA. The pre-job brief and discussion with the workers will give them a better understanding on when to anticipate a possible change. Applying a questioning attitude and using the proper instrumentation will help support this portion of job coverage.”

Slide #1.52 – Communication

“While at the jobsite, ask questions to get a stronger picture of the work taking place. An RCT should stay engaged with the work taking place. Examples of different types of questions can be: Can you point out the piping flow path? What happens when the equipment is energized? Where does the water drain to? Better understanding the activities taking place will improve the RCT’s alertness for things to look out for.”

Slide #1.53 – Right Tools for the Job

“Having the right tools for the job. The correct survey equipment must be used for the job coverage. Failure to monitor a specific type of radiation or contamination can result in posting violations, release of radioactive material to the public, or personnel contamination events. This was demonstrated in the lesson learned event at the beginning of the presentation. Here are some examples of the common instrumentation found at LANL and their detection capabilities.”

Slide #1.54 – Changes in Dose Rate

“An RCT needs to be aware of how different evolutions can impact radiation or contamination conditions. This anticipation can come from discussions in the RWP briefing and by understanding radiological principles. Here are some situations that have a potential to change local dose rates: Moving water, removing shielding, opening a system exposing beta radiation, energizing an RGD, and exposing a source.”

Slide #1.55 – Changes in Contamination

“Examples of actions that may potentially lead to a spread of contamination: Glovebox bag out or glove change, Grinding or Sanding, Starting or securing ventilation, Opening radioactive material, and releasing items from a CA”

Slide #1.56 – Pause/Stop Work Procedure

“While a job is being performed, it can be paused or stopped by any worker. P101-18, *Procedure for Pause/Stop Work* is the LANL policy that states the differences between pausing or stopping work and the conditions for each. An RCT should closely monitor for any conditions that necessitate a worker initiated pause/stop work, including any RWP requirement violations.”

Slide #1.57 – Pausing Work

“Worker-initiated pause of work is a simple process used to temporarily halt work so that confusions, misunderstandings, work area, work management, authorization, tool, or equipment issues may be resolved prior to proceeding. A pause is initiated, resolved, and a task re-engaged at the lowest practical level of worker, mentor, supervisor, or manager as the issue indicates. Pausing work is not an uncommon event during job coverage, but can be minimized by effective planning and preparation.”

Slide #1.58 – Stopping Work

“A stop-work action is a formal suspension of work activities. A stop-work action involves the official stand down of a single task, multiple activities, or operations within a facility or Laboratory program or project to address health, safety, environmental, procedural, security, waste generation noncompliance, and/or quality concerns that pose undue risk or imminent danger to personnel or the facility. Examples include: Condition of imminent danger, unsafe condition not immediately correctable, unsafe work method, inadequate hazard analysis,

unplanned hazards identified, and inadequate PPE. Failure to follow RPW requirements may result in stop work actions.”

Slide #1.59 – Reinforcing ALARA Practices

“Let us review the methods of keeping radiological exposure during job coverage As Low As Reasonably Achievable. There are many ways to implement ALARA practices, but they all can be categorized under one of the following:

Time, distance, shielding, and source reduction. The following slides will give examples of performing these different practices.”

Slide #1.60 – Minimize Time

“Methods that can help reduce the amount of time to perform a job include: Using experienced workers, perform mock-up training, pre-staging and inspecting all tools ahead of time, performing thorough pre-job briefs, and coordinating the work schedule with all groups involved. This includes verifying that no other work that can interfere with the job has been planned.”

Slide #1.61 – Maximize Distance

“Methods to keep workers away from radiological sources can be: Using extended reach tools as seen in the picture here, remote monitoring, such as using cameras or telemetry, moving the work location to an area of lower background, and utilizing low dose waiting areas. As an RCT, inform the workers to stay in these locations when practical.”

Slide #1.62 – Maximize Shielding

“Different forms of shielding that can be used for job coverage are: shield blocks, shield caves, lead blankets, water tanks, and roll-away shields. Shielding is a very effective and relatively easy way to help reduce exposure on a job. Adding a few lead blankets over a valve or even standing behind an existing wall are quick actions that can result in a large amount of saved dose.”

Slide #1.63 – Source Reduction

“The final ALARA principle is source reduction. Strategies to minimize or completely remove the source includes: radiological decay for short half-life isotopes, attempt to decontaminate the item or work area, or flushing of the system. These last methods can be effective in removing hot spots from a system.”

Slide #1.64 – Required Documentation

“Documentation of the work conducted is a very important part of an RCT’s duties. This paperwork acts as legal records that can be reviewed many years down the road. Because of this, it is important that things are filled out correctly and legibly to paint a clear picture on what took place. Various documents that may be necessary are: RP-PROG-FORM-114, *External radiation and contamination form*, RP-PROG-FORM-024, *Item removal log*, RP-PROG-FORM-036, *Contaminated Person Survey*, HPRMS tags, or filling out an RPIN.”

Slide #1.65 – Documenting Surveys

“RP-PROG-TP-200 requires both radiation and contamination surveys to be performed before, during, and after work that can potentially change radiological conditions. These shall be documented on either an RP-PROG-FORM 112, 113, or 114. Guidance in filling these out such as how to deal with blank spaces and corrected beta dose can be found on the back of the survey. Access to these forms can be found on EDRMS in the folder path shown below.”

Slide #1.66 – Creating an RPIN

“There will be times during job coverage where something goes unplanned. When this occurs, follow-up actions may be required. This is achieved by creating a Radiation Protection Initial Notification (RPIN). An RPIN is used to capture, document, and record radiological conditions or incidents at Los Alamos National Laboratory. Trending analysis is one of the features in the RPIN Devonway software. Having these events tracked and recorded allows for an opportunity to identify root causes and how to prevent them in the future.”

Slide #1.67 – RPIN Reporting Criteria

“An RPIN can be created based on either a facility or personnel event. The lists below shows reporting criteria in which an RPIN is required to be made. Facility based reporting criteria include events such as: CAM alarms, glovebox glove breach, RCA contamination greater than 5 times table 14-2 limits, and loss of radioactive material. Examples of personnel events are: radiation exposure greater than regulatory limits, personal clothing contamination, wound counts, and any procedural violations. Both drop-down boxes have a selection option labeled as other. This allows for any other events not listed in the provided drop-down menus to be documented as an RPIN.”

Slide #1.68 – How to Access the RPIN System

(See 3rd Quarter 2021 RPIN Video Transcript)

Slide #1.69 – Initiating an RPIN

(See 3rd Quarter 2021 RPIN Video Transcript)

Slide #1.70 – Editing an RPIN

(See 3rd Quarter 2021 RPIN Video Transcript)

Slide #1.71 – Knowledge Check #4

Slide #1.72 – Knowledge Check #5

Slide #1.73 – KC #5 Answer Key

Slide #1.74 – Performing a Whole-Body Frisk

“In the final portion of this training we will go over performing a whole-body frisk.

Whole-body frisking is an effective tool to monitor for personnel contamination. To ensure an accurate and representative survey is conducted, the correct distance, speed and instrument must be used. We will review the recommended DOE process to conduct a whole-body frisk from DOE-STD-1098-2017, *Radiological Control*. This standard acts a guideline for personnel contamination monitoring with hand-held survey instruments.”

Slide #1.75 – Frisking Guidelines

“Here are some frisking guidelines to improve the effectiveness of performing a whole-body frisk. Ensure instrument has been checked for the day and on the proper scale or mode.

If an audible feature is available, verify it is turned on. Audible responses will occur before seeing the counts displayed on the instrument. Probe distance should be $\frac{1}{4}$ inch from surface of the object being surveyed. Move probe slowly over surface approximately 1-2 inches per second. If the count rate increases during frisking, pause 5 to 10 seconds over the area until counts stabilize. Some instrumentation will need a longer time for the counts to stabilize, such as the Radeye SX with a dual scintillator probe.”

Slide #1.76 – Sequence of Monitoring

“While performing a whole-body frisk, perform the following in order: Frisk hands before picking up the probe, head while pausing at the mouth and nose for approximately 5 seconds, neck and shoulders, arms and pause at each elbow for 5 seconds, chest and abdomen, back, hips, and seat of pants”

Slide #1.77 – Sequence of Monitoring Continued

“Legs with focus on the knees for 5 seconds, shoe tops, shoe bottoms, pausing at the sole and heels, and lastly, survey all dosimetry worn. Return the probe to its holder or leave it on its side/face up to allow the next individual to monitor his or her hands before handling the probe.

Slide #1.78 – Conclusion

“Congratulations! You have successfully completed the online portion of RCT Continuing Training. To receive credit for RCT Continuing Training: 3rd Quarter 2021, you must now complete the Student Exercise Guide that has been provided to you. Once finished, email a copy of the completed guide to RP-Training@lanl.gov. Credit will be assigned for the exercise guide by the end of the quarter.”

RCT Continuing Training: 3rd Quarter 2021 RPIN Video Transcript

RP Home screen

“Accessing the RPIN system can be achieved by going to the Radiation Protection Application Catalog, or RPAC, found on the left hand side of the RP home page.”

RPAC screen

“The RPAC page is a helpful tool for RCTs, and it contains relevant applications for dosimetry, infrastructure, and operations. Helpful applications such as EDRMS, Data management systems and Sentinel can be found here. If you do not have access to EDRMS you should reach out to your HPFC, supervisor, or RP-Training to receive it. In this section we will be focusing on RPIN and some of the recent changes made to the RPIN software. Anyone has the authority to write an RPIN, but some facilities may have designated individuals to develop them.”

Initiating an RPIN

“Here is the homepage for the Devonway software where RPINs can be initiated, approved, and tracked. This screen may vary for different users with the names and numbers of tiles. To create an RPIN you can go over to the left side of the screen and click the arrows to open up the sidebar. You will see a tab stating NEW on it with a drop-down arrow. Towards the bottom of this menu is the RPIN link. Clicking this will take you to the RPIN initiate page. Another option that may be available for you is to go to the RPIN tile seen here. On there you can select the RPIN link which will also take you to the initiation stage.

Now we are ready to create a new RPIN, and for this training we will enter information based on the lesson learned discussed earlier in this presentation. First off, you will need to enter the date and time of the event. Next, in the box below is where the description of the event will be entered. The information placed in this section shall be a brief overview of what took place. You will have more opportunities later in this process to provide more details of what took place. This initial description will be sent out to all people associated with the specific group selected.

One important note for the event description is to ensure no names or personal information is placed in this box. Remember, this initial notification is sent out to everyone linked to the group that you selected. OUO and UCNI must not be included in the event description.

To select a group for notification, select the find items button. This will give you a drop-down or specific groups. Once initiated the RPIN will go to the distribution list associated with the RPIN location selected and management of the group identified under Group Notification. For our RPIN we will go to radiation protection TA-55 support, found in the ALDESHQSS folder.

To select where the event took place, click the find items location button. A window will open up displaying the different TAs and buildings found at LANL. Scrolling down we get to TA 55. You can now see buildings associated with this specific facility. These may even be broken down into individual rooms or halls. The room for this lesson learned event was 215 in PF4. Selecting this will cause it to auto populate into the location option on the initiation screen. For the location description you can enter something along the lines of RCA exit or RAM storage room if deemed necessary.

Once this information has been inputted it is time to select the reporting criteria for why the RPIN is being created. This is the criteria discussed in the previous slide. Here you see the different options of either a personnel or facility based event. In this particular case, the event which took place was a posting violation based off our P121 limits. So, we will select procedure violation, found under the personnel category as our reporting criteria.

After clicking the return button the screen now lists the reporting criteria with drop-down selection boxes. These new fields consist of the questions: Where was the event discovered? How was the event discovered? By what means was the event discovered? And any additional information the RCT may feel necessary to add for this initial RPIN submittal.

You can see by selecting each drop down menu that there are pre-filled options available to select. In the Where was the event discovered option, I will select within RCA. This event was discovered by a follow-up survey. A neutron survey was performed with a rem ball to find the HRA, so portable instrument is the selection for what means was the event discovered. I am not going to add any extra information in this phase of the RPIN process.

A review of all the information should be conducted before this RPIN is submitted. Look at event description, group notification and location description. Verify there is no UCNI or OUO. After reviewing the RPIN, select the green submit button. This will send an email to everyone in the group stating an RPIN has been initiated with your event description entered. Now we are in the edit report phase of submitting an RPIN.”

Editing an RPIN

“After the initial submittal, the screen will automatically take you back to your homepage. To get back to the RPIN you just created, go to the RPIN tile and select the all RPINs link. This will take you to a screen with a list of RPINs. The search criteria on the left can be used to help better locate a specific one you may be looking for. These filters include who the RPIN was assigned to, who initiated it, location of the RPIN event, and current status of the RPIN. Since I just submitted mine we see it here at the top of the list. I will now click on the details link to return to it and continue the RPIN process.

We are now back to our RPIN that was just initiated. Looking up on the top of the screen you can see that the status reads edit report. There is also a due date listed as well. This is automatically generated once the RPIN is sent out and is set for 30 days from submittal. The due date is when the RPIN will need to be reviewed and approved by. As the RCT creating the RPIN, this phase is where you will need to add more details about what took place.

These tabs show some of the information that may be necessary in the next steps of your RPIN submittal. The first tab is the reporting criteria which was filled out in the initiating phase of this process. Verify this information is still correct. The next tab is work and procedures associated with the event. Clicking this you will see a work activity section and procedure violation. The red asterisk next to the work activity indicates that this field needs to be filled out. Different options include activities such as performing a bag out, maintenance, filter changes and so on. For this scenario I will select the other option. After selecting this it will allow me to enter any additional information. I will type in movement of radioactive material for the description of the work activity.

Now that we have the work activity entered it is time to enter the procedural information which was violated. Procedure number for a posting violation is going to be P121 with the title being

Radiation Protection. The specific section or step that was violated is chapter 7, table 7-3, criteria for posting external radiation hazard. You can also see here that the procedure violated section is checked, indicating this has been selected as a reporting criteria.

The next tab is labeled as locations, and in this section you will be adding specific information that may be needed depending on the type of RPIN event. You can see on the right side of the screen under status it says not confirmed. This is because there is additional information that needs to be inputted to summarize what occurred. To add this information we will click on the go to locations link written in blue. You will now be redirected to a RAD results page. On this screen you will fill in any of these sections that relates to your event. Since it was a posting violation for this particular lesson learned, we will fill out the external radiation survey section. To do this, you will click the add button. This opens up new drop-down menus to fill out.

For area posting I will select HRA because this is what ended up being discovered after surveying the packages. In location description it will be PF 4, room 215. The survey distance was at 30 cm with neutron being the radiation type. 375 mrem per hour was the highest reading reported on the lesson learned so I will put that in these last sections. There are no other applicable sections on the locations tab to fill out for this RPIN. So now that I am finished with this I will go up and click the green button saying confirm location data. This now takes me back to the main screen for my RPIN. You notice that it still says not confirmed in red on the right side. To confirm the information I just submitted all I will need to do is click on the save button. Now my status is confirmed and I can move on to the next section, which is people.

The people tab is used to enter any survey data related to the personnel involved in the event. It is important to keep names out of these initial reports, so to do this the RPIN program allows for you to enter generic worker placeholders. For this event there were two workers involved, so I will select worker 1 and worker 2. If I wanted to add RCTs as well I can type it into the search bar and select any number of RCTs as well. But for now I will just keep the two workers for my data. Clicking return it takes me back to the people tab showing worker 1 and worker 2, both not confirmed. Now we will add any personal survey data associated with the event.

You can see here there are sections for radiation exposure, where you input any known dose received. Contamination results in case there was any sort of skin or clothing contamination events. Analytical results is where you would enter information for nasal swipes or wound

counts. For this specific RPIN, all we will need to do is input data for radiation exposure. You see when clicking this field there is a check box available stating dose assessment pending. This is here because it may take some time before any dose reports or investigations are available. By checking this box you can confirm the workers status and go back and enter these fields later on once the data is received. So I will check this box for both workers 1 and 2 while also confirming personal data. Once again, you see their statuses are still not confirmed. Like before, all I will need to do is click the save button and now they will switch to confirmed.

There is nothing I need to fill in for the glove breach failure tab for my RPIN so I will not worry about that entry. The documents tab is an important section where you can upload paperwork associated with the event. This can include information such as procedures, radiological surveys, dose reports and so on. It is important to attach all relevant information to your RPIN, so if it needs to be reviewed years down the line it can be clearly understood on what took place.

The follow-up actions tab is where you will enter what was done after the event including short-term and long-term actions to help stop the event and prevent it from occurring again. In this lesson learned, the follow-up actions recorded were: raise worker awareness to recognize those jobs/work that is being rushed, be critical of work being performed and follow work steps closely, create a new work activity, and to evaluate how material is taken out of the vault and when dose rates are to be taken and verified.

Once all of this information has been entered you will want to do another review making sure everything is correct. When you are confident with what you have inputted, you can go ahead and submit your RPIN for review.”